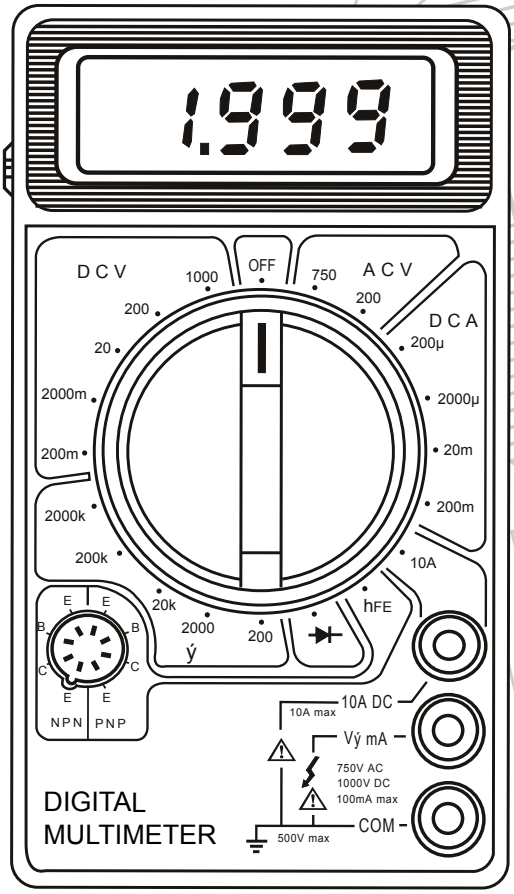
DT830 Series
3 1/2 Digital Multimeter

Owner's operation manual for 830 series

- Read this owner's manual thoroughly before use



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OEM & ODM manufacturer of test & measurement instruments in China

WARRANTY

This instrument is warranted to be free from defects in material and workmanship for a period of one year. Any instrument found defective within one year from the delivery date and returned to the factory with transportation charges prepaid, will be repaired, adjusted, or replaced at no charge to the original purchaser. This warranty does not cover expandable items such as batteries or fuses. If the defect has been caused by a misuse or abnormal operation conditions, the repair will be billed at a nominal cost.

SAFETY INFORMATION

DT830 series multimeter have been designed according to IEC-1010 concerning electronic measuring instruments with a measurement category (CAT Ⅰ 600V), the max. permitted transient voltage: 2500V, and pollution2.

ELECTRICAL SYMBOLS

~	AC (Alternating Current)
⎓	DC (Direct Current)
⚠	Important safety information. Refer to the manual.
ϟ	Dangerous voltage may be present.
⏚	Earth ground
⏛	Fuse
CE	Conforms to European Union directives
⧈	Double insulated

⚠ WARNING

To avoid possible electric shock or personal injury, follow these guidelines:

- Do not use the meter if it is damaged. Before you use the meter, inspect the case. Pay particular attention to the insulation surrounding the connectors
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads before you use the meter.
- This meter is designed to be indoor use.

- Do not use the meter if it operates abnormally. Protection may be impaired. When in doubt, have the meter serviced.
- Do not operate the meter around explosive gas, vapor, or dust.
- Do not apply more than the rated voltage, as marked on the meter, between terminals or between any terminal and earth ground.
- Before use, verify the meter's operation by measuring a known voltage.
- When measuring current, turn off circuit power before connecting the meter in the circuit. Remember to place the meter in series with the circuit.
- When servicing the meter, use only specified replacement parts.
- Use with caution when working above 30V ac rms, 42V peak, or 60V dc. Such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards on the probes.
- Connect the common test lead before you connect the live test lead. When you disconnect test leads, disconnect the live test lead first.
- Remove the test leads from the meter before you open the battery door.
- Do not operate the meter with the battery door or portions of the cover removed or loosened.
- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator (" ") appears.
- Remaining endangerment:
  When an input terminal is connected to dangerous live potential it is to be noted that this potential at all other terminals can occur!
- CAT I-Measurement Category I is for measurements performed on circuits not directly connected to mains. (Examples are measurements on circuits not derived from mains, and specially protected (internal) MAINS-derived circuits. In the latter case, the transient stresses are variable; for that reason, its necessary that the transient-withstand -capability of equipment is made known to the user.).
  Don’t use the equipment for measurement within Measurement Categories II,III and IV.

CAUTION

To avoid possible damage to the meter or to the equipment under test, follow these guidelines:

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- Use the proper terminals, function, and range for your measurements.
- Before measuring current, check the meter's fuses and turn power off to the circuit before connecting the meter to the circuit.
- Before rotating the range switch to change functions, disconnect test leads from the circuit under test.
- Before attempting to insert transistors for testing, always be sure that the test leads have been disconnected from any measurement circuits.
- Remove test leads from the meter before opening the Meter case.

MAINTENANCE

- Before opening the case, always disconnect the test leads from all live circuits.
- To continue protection against fire, replace fuse only with the specified voltage and current ratings: F 250mA/250V (Fast Blown) Ø 5 x 20
- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

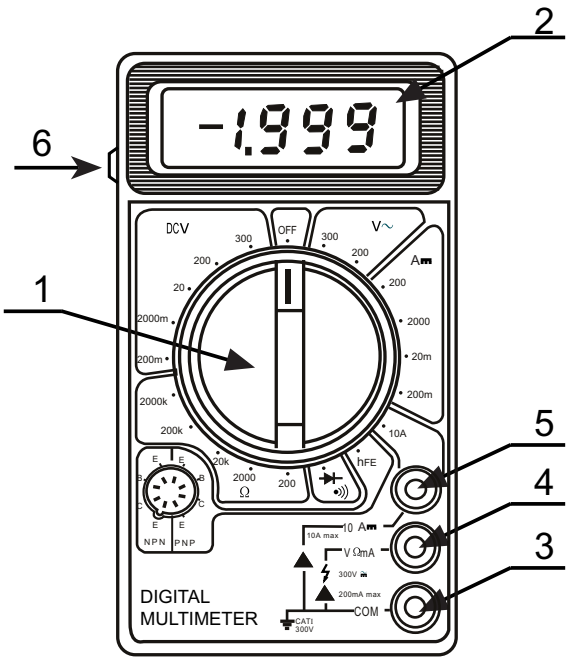
GENERAL DESCRIPTION

830 series multimeters are pocket-sized 3 1/2-digit digital multimeters for measuring DC and AC Voltage, DC Current, Resistance and Testing Diode. Some models also provide transistor test function, signal output or performing continuity test. Overload protection and low battery indication are provided. Following table shows functions of the series multimeters.

MODEL	DCV	ACV	DCA	Ω	hFE	⊣◀	)))	TEMP	▲	LIGHT	BAT
830	*	*	*	*		*	*				*
830A	*	*	*	*		*			50Hz		*
830B	*	*	*	*	*	*					
830D	*	*	*	*		*	*				
830E	*	*	*	*			*				*
832	*	*	*	*	*	*	*		50Hz		
832H	*	*	*	*	*	*	*		1000Hz		
837	*	*	*	*		*	*	*			
838	*	*	*	*	*	*	*	*			
830BL	*	*	*	*	*	*				*	

▲ This function allows the meter to output a signal as a signal generator.

FRONT PANEL DESCRIPTION



1. FUNCTION AND RANGE SWITCH

This switch is used to select the functions and desired ranges as well as to turn ON/OFF the meter.

To extend the life of the battery, the switch should be in the "OFF" position when the meter is not in use.

2. DISPLAY

3 1/2 digits, LCD(12mm)

3. "COM" JACK

Plug in connector for black (negative) test lead.

4. "**VΩmA**"JACK

Plug in connector for red (positive) test lead for all voltage, resistance and current (up to 200mA) measurements.

5. "10A"JACK

⚠ Plug in connector for red (Positive) test lead for current (between 200mA and 10A) measurement. There is no fuse for "10A" jack. To use safely, each measurement can not last for more than 10 seconds, and the interval between each measurement must be more than 15 minutes.

6. LIGHT SWITCH (only for DT830BL)

Switch for " torch light " and " back light ".

SPECIFICATION

Accuracies are guaranteed for 1 year, 23°C±5°C , less than 75%RH.

1. DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200mV	100 μV	±0.5% ± 5D
2000mV	1mV	
20V	10mV	
200V	100mV	
1000V	1V	±1.0% ± 5D

Input impedance: 1MΩ
Max. input voltage: 1000V DC or 750V AC rms (for 200mV range: 500V DC or 350VAC rms).

2. AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200V	100mV	±1.2% ± 10D
750V	1V	

Frequency response:45-400Hz
Max.input voltage: 750V AC rms
Display: sine wave rms. average response

3. DC CURRENT

RANGE	RESOLUTION	ACCURACY
200 μA	100nA	±1.0% ± 5D
2000 μA	1μA	
20mA	10μA	
200mA	100μA	±1.2% ± 5D
10A	10mA	±2.0% ± 5D

Overload protection:F 250mA/250V Fused (10A unfused)

4. RESISTANCE

RANGE	RESOLUTION	ACCURACY
200Ω	0.1Ω	±1.2% ± 5D
2000Ω	1Ω	±1.0% ± 5D
20KΩ	10Ω	
200KΩ	100Ω	
2000KΩ	1KΩ	±1.2% ± 5D

Max. open circuit voltage: about 3V.

5. TEMPERATURE

RANGE	RESOLUTION	ACCURACY
0°C~+1000°C	1℃	±3°C ±2D<150°C
		±3% >150°C

6. hFE

Vcc about 3V, I_b about 10μA, display hFE 1-1000

7. DIODE AND BUZZER

Diode: Testing Voltage about 2.8V, current about 1mA. The approximate forward voltage drop in mV will be displayed.
Buzzer: The buzzer will sound when it is less than about 50Ω.

8. SIGNAL OUTPUT

Signal output: square wave (50Hz) or sine wave (1000Hz).
Level output: 5Vp-p

9. BATTERY TEST

Range	Description	Test Condition
1.5V	The working voltage of the battery will be displayed on the LCD, so that the quality of the battery can be judged.	The working current is about 20mA.
9V		The working current is about 5mA.

GENERAL SPECIFICATION

- Display: ---------- 3 1/2 digits LCD with a max. reading of 1999
- Polarity: ---------- Auto polarity indication.
- Overrange indication: ------ Only figure "1" on the display.
- Operating environment: --- temp. 0 ~ 40*; relative humidity<75%.
- Storage temperature: ------ -15* ~ 50*; relative humidity<90%.
- Battery: ---------- 9V 6F22/1.5V X 2 AA (for DT830BL only)
- Low battery indication: ---- "[+ −]" or "BAT" appears on the display.
- Dimensions: ---------- 139mm×78mm×40mm
- Weight: ---------- 170g
- Power consumption: ------- 20mW

OPERATING INSTRUCTION

DC CURRENT MEASUREMENT

1. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack.
2. Set the range switch to the desired A⎓ range.
3. Open the circuit in which the current is to be measure, and connect the test leads in series with the circuit.
4. Read the current value on the LCD display along with the polarity of the red test lead.

DC VOLTAGE MEASUREMENT

1. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack.
2. Set the range switch to the desired V⎓ range. If the voltage is not known beforehand, set the range switch at the highest range position and then reduce it range by range until satisfactory resolution is obtained.
3. Connect the test leads across the device or circuit to be measured. Read the voltage value on the LCD display along with the polarity of the red test lead.

AC VOLTAGE MEASURE

1. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack.
2. Set the range switch to the desired V~ range.
3. Connect test leads across the device or circuit to be measured and read the voltage value on the LCD display.

RESISTANCE MEASUREMENT

1. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack.
2. Set the range switch to the desired Ω range.
3. If the resistor to be measured is connected to a circuit, disconnect circuit power and discharge all capacitors before measuring resistance.

4. Connect the test leads across the resistor to be measured and read the resistance value on the LCD display.

TEMPERATURE MEASUREMENT

1. Set the range switch to the "TEMP" range, and the meter will show the current room temperature without any external thermocouple connections.
2. Connect the K type thermocouple to the **"VΩmA"** and "COM" jacks. Contact the object to be measured with the thermocouple carefully. Read the temperature value on the LCD display.

TRANSISTOR TEST

1. Set the range switch to the "hFE" range.
2. Determine whether the transistor to be tested is PNP or NPN type and locate the emitter, base, collector leads. Insert the leads into the proper holes of the hFE socket on the front panel. The meter will display the approximate hFE value.

DIODE & CONTINUITY MEASUREMENT

1. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack.
2. Set the range switch to the ⊣◀ range.
3. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode of the diode.
4. The approximate forward voltage drop of the diode will be displayed in mV. If the connection is reversed, only figure "1" will be shown on the LCD.
5. Connect the test leads to the two terminal of the circuit to be tested. If the resistance is lower than about 50Ω , the built-in buzzer will sound.

TEST SIGNAL OUTPUT

1. Set the range switch to "⊓⊔" or "∿" range.
2. A test signal will appear between the **"VΩmA"** and "COM" jacks. The voltage is approximate 5Vp-p. A coupling capacitor should be used when connecting the meter to a circuit.

Cautions:

a. This is output signal. be sure not to measure voltage
b. There is no shortcircuit protection.
c. The voltage of the reversed signal of the output terminal should not exceed 40Vp-p.

BATTERY MEASUREMENT

1. Set the range switch to the desired "BATT" range (1.5V or 9V).
2. Connect the red test lead to the **"VΩmA"** jack and the black test lead to the "COM" jack. And connect the test leads to the two terminals of the battery to be measured and read the value on the LCD display.

BATTERY AND FUSE REPLACEMENT

If the sign " ⊟ " appears on the LCD display, it indicates that the battery should be replaced. If the error of the reading is too much, it also indicates that the battery should be replaced. To replace the battery, loosen the screws on the back cover and open the case. Replace the exhausted battery with a new one of the same type.

The fuse rarely needs to be replaced and is blown as a result of the operator's error. To replace the fuse, open the case and replace the blown fuse with the ratings specified: F 250mA/250V.

⚠ WARNING

Before attempting to open the case, always be sure that test leads have been disconnected from measurement circuits. Close case and tighten screws completely before using the meter to avoid electrical shock hazard.